REMARKS

Claims 44-47 and 49-54 were rejected as being unpatentable over Brandenburger in view of Smith, Sherman, Keldany et al. or Koster. Reconsideration and withdrawal of these rejections are respectfully requested.

The subject matter of dependent claims 45, 46, 48, 49, 50 and 51 has been incorporated into independent claim 1. As the limitations added to independent claim 1 were drawn from a number of now-canceled dependent claims, not only has no new subject matter has been added to the claims, but the added subject matter has been previously fully searched and considered by the Examiner. Therefore, no new search is required by the present amendments to the claims. In turn, it is respectfully submitted that examination of these amended claims will not require any consideration that could reasonably be characterized as "undue". As the amended claims define embodiments that have no counterpart in Brandenberger and are not suggested thereby (as will be developed fully below), the present amendment after final rejection may properly be entered and the application allowed on the basis of the now pending claims, without requiring the applicant to expend the time and resources necessary to refile this application.

As claimed, the method for lining a pipe includes helically winding the structural layer into opposing helical directions within a pipe and then arranging a further containment layer within the structural layers and seaming it to make is substantially impermeable and thereafter bonding the containment layer to the internal surface of the structural layer.

There are certain advantages to winding the structural layer within the pipe as opposed to pre-winding it and then inserting a tube into the pipe and securing it in place as described in the Brandenberger patent. The internal diameter of pipes is generally not consistent especially where there are joints in the pipe. By pre-winding a lining layer and then inserting it into a pipe the

diameter of the lining is restricted by the mandrel size on which it is wound. Accordingly, when the lining is inserted into the pipe, although it may be expanded to substantially the same diameter as the pipe, its size is defined by the mandrel, not the interior dimensions of the pipe. If the lining is to reinforce the already existing structural strength of the pipe, as opposed to merely being a second structural layer within existing pipe, then it is necessary for it to substantially come into contact with the pipe all around the diameter of the pipe and along its length. The only way this can be achieved according to Brandenberger is if the lining pipe is made oversized, such that when it is expanded within the pipe, it can be guaranteed that it does indeed come into contact with the sides of the pipe all the way round. The problem this then creates is that when the lining is oversized, there will be places within the lining of the pipe at which creases develop in the lining to accommodate the excess material present as a result of the lining being oversized. As is well known within structures, any creases within a tubular structure decrease its strength, in particular its ability to withstand compressive forces. Furthermore, with the Brandenberger patent, where there are joints within the pipes (which are areas which often have a slightly reduced cross-section), then it is even more likely that creases of the lining material will occur at these points. As joints are often areas where leaks can occur, the potential structural weaknesses created in these areas by the method described in the Brandenberger patent could potentially result in the failure of the structural strength of the lining.

In contrast, the claimed embodiment winds two concentric structural layers (formed by the claimed first and second strips of structural winding material) within the pipe. Because of this, these structural layers can be properly in contact with the pipe irrespective of its cross-section, or any changes therein and can, therefore, properly support the existing structure of the pipe. Furthermore, when seaming spirally round pipes in tubes it is notoriously difficult to achieve a

perfect seal continuously along the length of the spiral join which, due to its spiral nature, is far greater in length than the length of the pipe being lined. In the present invention, a separate containment layer is provided by arranging at least one section of sheet material concentrically within the structural layer and seaming it to render it impermeable. The containment layer is then bonded to at least a portion of the internal surface of the structural layer. This retains the interior shape of the pipe. The claimed method thereby enables a proper structural lining of a pipe in which the structural lining material comes properly into contact with the internal surface of the pipe at all points along its length and a separate containment layer therein, which can be accurately seamed to ensure fluid impermeability.

None of the Smith, Sherman, Keldany et al or Koster secondary references teach or suggest any such methods, whether considered alone or in combination with the primary reference to Brandenburger.

Indeed, Smith teaches to wrap a single membrane internally upon the inner wall in the form of a helical spiral, see Col. 1:

> Briefly and in summary, the method of this invention comprises spirally unwinding a sealing membrane from a roll within a conduit, followed by pressing and adhering the membrane against the inner circumferential wall of the conduit while moving the roll of the membrane longitudinally within the conduit with means attached to the roll and actuated from a position external to the conduit.

... as does Sherman, as disclosed in col. 2 of this reference:

> FIGS. 6 and 7 illustrate an apparatus for use in applying a strip of the plastic material to the exterior surface of a pipe or other object. The extruder 12ª and strip 13ª may be substantially the same as disclosed in FIGS. 3 and 4. The strip is wound spirally on the exterior surface of the article 27. The seam is formed and the edges welded together by a pressure roll 28 mounted in a yoke 29 and traveling along the seam as it is formed. This roll integrally unites the edges, operating in the same manner as above described in connection with the roller 28.

Keldany et al. teach to form a wound tube by helically winding a band of plastic material and coating the exterior of the wound tube with hardenable stiffening material and thereafter inserting the coated wound tube within the existing pipe – see claim 1:

> 1. A method for increasing the stiffness of flexible plastic tubes after they are inserted into existing through-passages or into existing pipe lines, comprising the following steps: at an entrance to a through-passage, continuously forming a spirally wound tube from a band of plastic material with side edges of the band in abutting relationship, the wound tube being flexible and having an initial stiffness; simultaneously pushing the wound tube into the through-passage as it is being formed; applying a hardenable stiffening material onto the outer wall surface of the wound tube as it is being formed and thereafter, but before the setting of the stiffening material, positioning the wound tube with applied stiffening material at a desired position within said through-passage; and permitting the stiffening material to set to thereby impart to said wound tube after it is in its desired position in the through-passage a stiffness increase by the setting of the stiffening material when compared with its initial stiffness.

Koster teaches to wrap strips 21 in a counterclockwise direction on a mandrel, together with the application of resin:

> FIG. 5 shows in more detail the mechanism for applying liquid resin to the surface of strip **21**. Winding mechanism **137** rotates counter clockwise looking down and includes spindles **15** on which spools **30** are mounted. Liquid resin is fed from pressurized canister **142** to metering pumps **143** of the positive displacement type thence to resin applicator head **144** which is mounted on pivoting arms **145**. Arms **145** are attached to spindles **15**. Arrows **146** indicate the path of the liquid resin. Pumps **143** are geared to fixed gear **147** and thus supply resin only when winding mechanism **137** is rotating. The resin applicator head **144** consists of a

As shown in Fig. 5, the two strips 21 are wound in the same direction – counterclockwise about the mandrel:

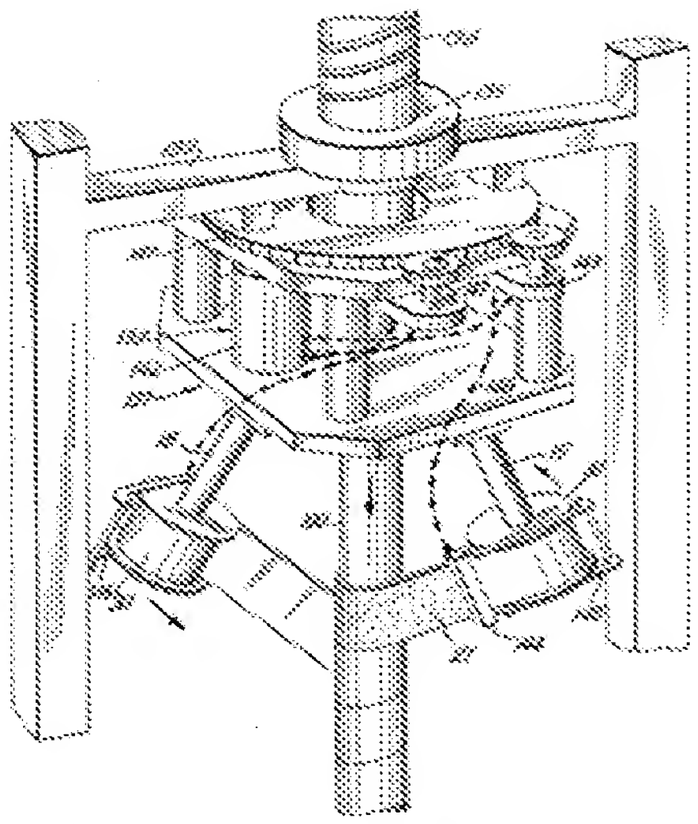

FIG.5

This is contrary to the claimed embodiment, in which a second strip of structural lining material is helically wound in the pipe in a second helical direction that is opposite the first helical direction to form a plurality of turns. Indeed, still undisclosed in this and the other secondary references (or the applied combination as a whole) is the claimed structural layer formed by, as claimed,

> **arranging a first strip of structural lining material by helically winding the first strip in the pipe in a first helical direction to form a plurality of turns, each turn of the first strip being in substantial helical contact with a previous turn of the first strip, thereby forming a first substantially continuous tubular structural layer within the pipe, and by arranging a second strip of structural lining material by helically winding the second strip in the pipe in a second helical direction that is opposite the first helical direction to form a plurality of turns, each turn of the second strip being in substantial helical contact with a previous turn of the second strip, thereby forming a second substantially continuous tubular structural layer within the pipe.**

Moreover, the applied combination fails to teach or to suggest a separate containment layer provided by arranging at least one section of sheet material concentrically within the structural layer (helically wound by two strips helically wound in opposite directions, as detailed immediately above) and seaming it to render it impermeable. The containment layer is then

bonded to at least a portion of the internal surface of the structural layer. This retains the interior shape of the pipe. Therefore, the claimed method provides a proper structural lining of a pipe in which the structural lining material comes into intimate contact with the internal surface of the pipe at all points along its length, and a separate containment layer therein, which can be accurately seamed to ensure fluid impermeability.

As the applied combination of references does not teach or suggest the claimed steps of independent claim 1 and in view of the amendments to the claims and the foregoing remarks, therefore, it is respectfully submitted that the 35 USC §103(a) rejections should be reconsidered and withdrawn. The same, therefore, is respectfully requested.

As noted above, it is believed that the present amendment after final rejection is properly enterable after final, as the amendments to the claims overcome the applied combination of references without, however, adding any new matter or subject matter that has not been previously searched and considered by the Examiner. Of course, the Examiner may wish to update his search before allowing the present application, but such a search is not necessitated by the nature of the amendments to the claims. Consideration of the present amended claims would not impose, it is respectfully submitted, an "undue burden" upon the Examiner.

Applicants believe that this application is now in condition for allowance. If any unresolved issues remain, please contact the undersigned attorney of record at the telephone number indicated below and whatever is necessary to resolve such issues will be done at once.

Respectfully submitted,

Date: February 21, 2011 By: _____

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